Raypak Pool & Spa Heaters
Residential & Premium Range

Installation and Operating Instructions - Version 2

Residential Models: P0131, P200, P0280, P0350, P0430
Premium Models: PC0127, PC0167, PC0280, PC0430

Please read this manual prior to installing this product. It contains all the necessary technical and installation information that will be required by the contractor to correctly install this system. This product must be installed to the Rheem installation instructions, AS5601, AS3500.4 and the relevant electrical authorities' requirements.

Effective 01/12/06

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Date of installation:	
Model No.	
Serial No.	
Installed by:	
Purchased from:	

This Installation and Operating Instructions manual is provided with the necessary information for the proper installation, operation and maintenance of your Raypak Heater. Please review and follow these procedures carefully. Keep this manual in a safe and accessible place for easy reference in the future.

SAFETY

WARNING!

For your safety do not operate this appliance before reading this instruction booklet! Improper installation, adjustment, alteration, service or maintenance can cause injury or property damage.

DO NOT enter water heated by this appliance without testing temperature first. Temperatures above 45^{o}C can cause severe burns. Prolonged exposure to elevated water temperatures may be hazardous to your health.
DO NOT use this appliance to heat water for drinking.
DO NOT place articles on or against this appliance.
DO NOT store chemicals or flammable materials in the same room as this appliance.
DO NOT spray aerosols near this appliance.
DO NOT operate this appliance with any panels, covers or guards removed.
DO NOT enclose this appliance unless it has been constructed for such an installation.
DO NOT operate whilst cleaning you pool.

WHAT TO DO IF YOU SMELL GAS!

- **DO NOT** try to light this appliance.
- **DO NOT** touch any electrical switch.
- **TURN OFF** the gas supply at the meter immediately, contact a licensed gas fitter or Rheem Service. N.B: Some gases are heavier than air and it may be necessary to check for gas leaks at floor level.

Ceramic Firetile refractory is used in this appliance. For a current MSDS go to www.thermalceramics.com and enter “MSDS 354” in the search. Ceramic Firetile refractory may produce smoke when the appliance is first started. Ensure area is well ventilated when lighting appliance. Avoid breathing fumes.

For your own safety only have this appliance installed by a licensed gas fitter who must issue you with a compliance certificate when complete. Persons taking medications which induce drowsiness should not use spas. Persons with a medical history of heart disease circulatory or blood pressure problems, or diabetes should obtain their Doctor’s advice prior to using a spa.

WATER TREATMENT

IMPORTANT!
CORROSIVE WATER VOIDS YOUR WARRANTY.

For your health and the protection of your heater it is essential that your water quality is always chemically balanced. Only incorrect water balance will cause your heat exchanger to corrode. After corrosion occurs, subsequent water chemical tests may not reveal the water quality at the time that the damage occurred. Do not replace any corroded parts before bringing your water quality back into balance. The following table provides a guide to good water balance:

	Fibreglass Pools (less than 31C)	Fibreglass Spas (more than 31C)	Other Pools & Spas
pH	7.3 - 7.4	7.3 - 7.4	7.6 - 7.8
Total Alkalinity (PPM)	120 - 150	120 - 150	80 - 120
Calcium Hardness (PPM)	200 - 300	200 - 300	200 - 400
Salt (PPM)	6,000 MAX	6,000 MAX	6,000 MAX
Free Chlorine (PPM)*	2 - 3	2 - 3	2 - 3
Langelier Saturation Index	-0.3 to +0.3	-0.3 to +0.3	-0.3 to +0.3

*** FREE CHLORINE MUST NOT EXCEED 4 PPM**
*** FREE BROMINE MUST NOT EXCEED 5 PPM**

There are several factors that need to be considered in order to avoid damage to your heater.

- Automatic chemical dosing devices and chlorinators are usually more efficient in heated water and/or covered pools/spas. Unless controlled, they may lead to excessive chlorine levels which can damage your heater.
- If the sanitising level in your pool/spa is too high, your test kit or that of your pool shop may not show the correct chlorine/bromine concentration.
- If your salt chlorinator operates for extended periods whilst the pool is being heated and the weather is overcast or your pool is enclosed / covered, the chlorine may exceed the recommended levels.
- The balance of your pool water depends on a combination of pH, total alkalinity, calcium hardness and temperature. Combined, these factors enable the Langelier Saturation Index to be calculated. It is essential these factors are maintained at the recommended levels so that the water is balanced and the sanitation of your pool will be optimal.
- When adding acid to lower your pH, it must **always** be added in small quantities and spread uniformly over the entire pool surface. Do **not** add acid one litre at a time. Instead, add a cupful each day. Do **not** add acid into the skimmer box. This may potentially lead to corrosion of your heat exchanger.

INSTALLATION INSTRUCTIONS

ATTENTION! *This appliance must be installed in accordance with all local state and federal laws including the regulations of any government bodies and in complete accordance with these instructions. Where these instructions are contrary to the law or regulations of an appropriate government body those laws or regulations should take precedence subject to there being no compromise to safety.*

BEFORE YOU COMMENCE INSTALLATION

1. Read these instructions in full.
2. Check that the heater you have been supplied is suitable for the gas type that is available.
3. Ensure that your gas fitter checks that the gas supply pressure is between the minimum and maximum specified on the heater data plate.
4. Confirm that the heater you have purchased is suitable for the location it is to be installed, i.e. Outdoor or Indoor.
5. Check that your pool system pump will provide water flow between the specified minimum and maximum flow rates required for the heater to operate.
6. Remove packaging and timber base before installation.
7. Complete all details on the back page of this book.

BEFORE INSTALLATION

RESIDENTIAL OR COMMERCIAL!

Raypak "Residential" heaters are designed and built for installation in applications where the intention of its use is to heat a pool of a single family dwelling. Residential heaters are not intended for installation in commercial applications such as multi residential apartments. For these applications a Raypak "Commercial" (also referred to as "Premium") heater should be selected.

See **WARRANTY** section in this book for details of the different warranties dependent on the heater type and its intended application.

HEATER LOCATION

The heater must be located so that any possible water leaks will not damage adjacent areas or structures. When such locations can not be avoided it is recommended that a suitable drain pan be constructed and installed by your plumber. This must not restrict air required for combustion.

The heater must be located on a level non-combustible surface such as concrete. All packaging must be removed before installation.

OUTDOOR HEATERS

Raypak heaters are built as standard for outdoor installations. Their installation must conform to **AS5601** as a minimum. They must not be installed in any enclosed structure or under eaves, roof overhangs, or pool decks. Outdoor heaters must be installed at least **1500mm** from any window or room ventilation opening. They must also have no obstructions above the appliance.

If installing the heater on a raised base, this base must be non-combustible and contain no air openings or perforations. Drafts from below the heater can affect its operation.

High Wind Areas

Raypak gas heaters are atmospherically vented and so may not function correctly in areas of sudden changing air pressure often caused by high or variable wind speeds. In some instances, it may be necessary to install either a **Raypak High Wind Top** or a **Raypak Induced Draft Fan** to ensure correct operation. These options should be discussed with Raypak before installation.

INDOOR HEATERS

Combustion / Ventilation Air

Indoor heaters must only be installed in a protective enclosure or properly constructed room, with ventilation in accordance with **AS5601.** Ventilation must be provided via two permanent openings, one at ceiling level and

one at floor level. Minimum vent area must be at least **630cm^2** unless otherwise stated in **AS5601**. Minimum opening dimensions in the vent must be at least **6mm**.

In indoor applications the heater must have at least the minimum clearances specified in the table below. Increased clearances should be provided where possible to improve serviceability. Servicing may not always be possible where the minimum clearances are observed therefore good installation practices should determine what reasonable clearances are required for each installation location.

The following table details minimum acceptable clearances (mm) for indoor installations on non-combustible floors **only:**

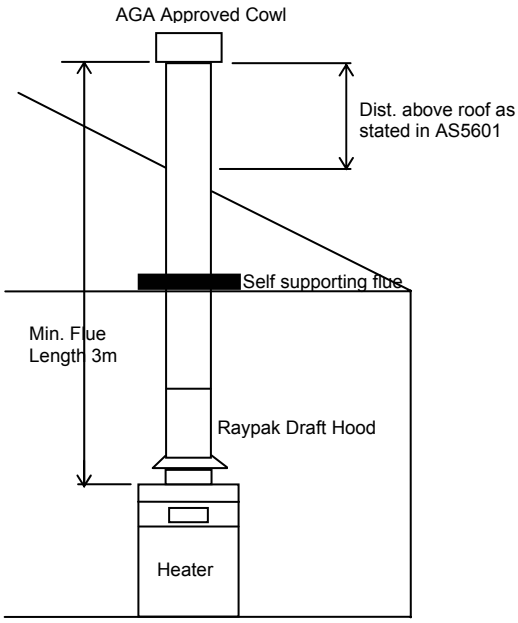
Rear	Front	LH Side	RH Side	Above
Non-Combustible Surfaces				
150	750	600	150	1200
Combustible Surfaces				
500	750	600	500	1200

N.B: For outdoor clearances refer to AS5601

Air supply to the room must not be affected by mechanical exhausts of other equipment such as bathroom or kitchen fans, spa blowers or air-conditioning equipment, etc.

Flueing

Flueing must be in accordance with **AS5601**. Only the correctly-sized Raypak draft diverter must be fixed to the heater and connected to a properly constructed flue, vented to atmosphere using approved fittings, and cowl. Alteration to the Raypak draft hood or reduction in cross section of connected flueing will **void warranty**.



Where standard flueing options can not be implemented Raypak should be contacted for flueing advice.

Additional ductwork connected to the Raypak draft hood must be self supporting and allow the removal of the Raypak heater and draft hood without removal of the flue. The flue system beyond the Raypak draft hood must in no circumstances be supported by the heater.

Where practical, the flue should be run vertically. Lateral flueing is allowed but must rise a minimum of 20mm per 1m of lateral run and the total lateral run must not exceed 50% of the total flue height.

Indoor Hood Conversion

To convert the heater from outdoor configuration to indoor:

1. Remove all screws form the appliance top panel and discard sheet metal.
2. Fit the indoor flue “stack adaptor” supplied with the indoor conversion kit to the flue collector and screw in position.
3. Fit the “draft diverter” over the indoor flue “stack adaptor” spigot.
4. Ensure that all connections are secure and will not allow products of combustion to escape into the room.

GAS SUPPLY

The gas supply pipe and gas meter must be sized so that both are capable of providing sufficient gas for all gas appliances on the site to operate at the same time. Insufficient gas supply will cause the heater to operate below its designed performance or not at all.

Correct pipe sizing for the gas fitting line should be obtained from **AS5601**. During commissioning of the heater the burner pressure must be adjusted by the gas fitter to conform to the specifications provided on the Raypak Dataplate - located inside the heater. The heater and its gas line must be fully leak-tested prior to normal operation.

Note: It is more important than ever that when installing a new gas pool or spa heater, the commissioning must be carried out by a **licensed plumber**. Gas supply companies are increasingly supplying natural gas to new

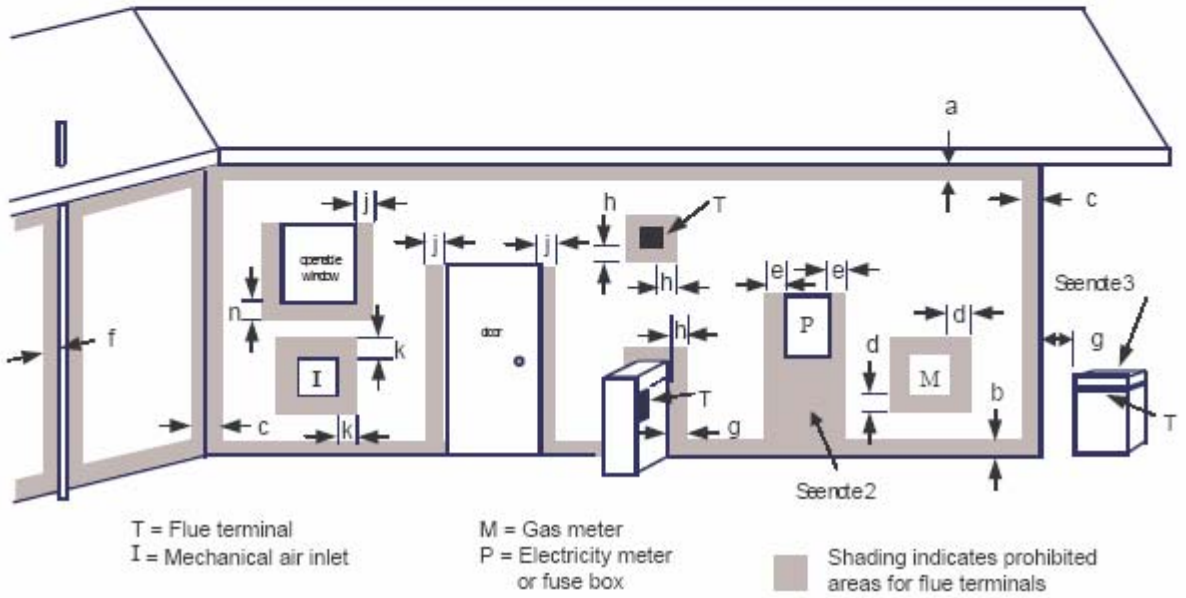
installations with 2.75Kpa. This means if the gas pressure is not adjusted to the correct working pressure (see data plate) the heater will be over gassed and cause serious damage within minutes This damage is not covered under the Warranty.

Caution! *Excessive Gas Pressure will damage the gas valve and* ***void warranty****.*

energysafe VICTORIA

Gas Information Sheet No. 26

Flue clearances



T = Flue terminal
I = Mechanical air inlet

M = Gas meter
P = Electricity meter or fuse box

Shading indicates prohibited areas for flue terminals

Ref.	Item	Minimum clearances (mm)	
		Natural draught	Fan assisted
a	Below eaves, balconies and other projections:		
	• Appliances up to 50 MJ/h input	300	200
	• Appliances over 50 MJ/h input	500	300
b	From the ground, above a balcony or other surface †	300	300
c	From a return wall or external corner †	500	300
d	From a gas meter (M)	1000	1000
e	From an electricity meter or fuse box (P)	500	500
f	From a drain pipe or soil pipe	150	75
g	Horizontally from any building structure † or obstruction facing a terminal	500	500
h	From any other flue terminal, cowl or combustion air intake †	500	300
j	Horizontally from an openable window, door, non-mechanical air inlet or any other opening into a building with the exception of sub-floor ventilation:		
	• Appliances up to 150 MJ/h input	500	300
	• Appliances over 150 MJ/h input up to 200 MJ/h input	1500	300
	• Appliances over 200 MJ/h input up to 250 MJ/h input †	1500	500
	• Appliances over 250 MJ/h input †	1500	1500
	• All fan-assisted flue appliances, in the direction of discharge		1500
k	From a mechanical air inlet, including a spa blower	1500	1000
n	Vertically below an openable window, non-mechanical air inlet, or any other opening into a building with the exception of sub-floor ventilation:		
	• Space heaters up to 50 MJ/h input	150	150
	• Other appliances up to 50 MJ/h input	500	500
	• Appliances over 50 MJ/h input and up to 150 MJ/h input	1000	1000
	• Appliances over 150 MJ/h input	1500	1500

† - unless appliance is approved for closer installation

WATER –
PRESSURE, CONNECTIONS, & FLOW

Pressure Relief Valve

If the filtration system incorporates any valves or accessories that may isolate the heater from the pool or spa, a pressure relief valve must be fitted to the heater. Specifications and installation advice relating to this valve can be obtained from Raypak.

Pressure Switch Function

The heater is supplied standard with a Pressure Switch that when correctly adjusted will only allow the heater to operate when there is sufficient water pressure. **In every installation the Pressure Switch operation must be checked** as part of the commissioning process.

Caution! *The Pressure Switch is only suitable as a means of ensuring adequate water pressure if the Inlet/Outlet piping of the heater is less than 1500 mm above or below the water level of the pool. For installations which exceed this range a* ***flow switch*** *must be installed. Specifications and installation advice relating to this switch can be obtained from Raypak.*

Caution! *Ensure that all water valves are correctly positioned to allow flow through the pool heater. If the water flow valves are not correctly positioned the heater may ignite without flow through the heater. This will damage the pool heater and/or the system and will void warranty.*

Pressure Switch Adjustment

Models: Spartan, 200, 280, 340, 430.

1. Remove the In/Out access cover to gain access to the pressure switch.
2. Check that all water valves are correctly positioned to enable normal water flow to the pool heater.
3. Start the system pump and ensure that water is flowing through the heater.
4. Turn the power on at the heater.
5. Adjust the set point of the heater to 40ºC.
6. If the heater lights the water pressure is within the pressure switch range and the pressure switch will not need to be adjusted.
7. If the heater did not light after Step 5, turn the Pressure Switch knurled adjustment wheel located on the pressure switch, **clockwise** until the heater ignites, then continue a further ¼ of a turn.
8. Turn off the pump and the heater should now go out. If the heater does not go out, the heater must be turned off immediately and Raypak should be contacted.
9. The pump should be cycled on and off several times to ensure that the adjustment is correct.

Pressure Switch Adjustment

Models: 127, 167.

1. Remove cover to gain access to the pressure switch.
2. Check that all water valves are correctly positioned to enable normal water flow to the pool heater.
3. Start the system pump and ensure that water is flowing through the heater.
4. Turn the power on at the heater.
5. Adjust the set point of the heater to 40ºC.
6. If the heater lights the water pressure is within the pressure switch range and the pressure switch will not need to be adjusted.
7. If the heater did not light after step 6, using an Allen key, turn the adjustment screw anti-clockwise until the heater fires and then continue one quarter turn.
8. The pump should be cycled on and off several times to ensure that the adjustment is correct.

Voiding Warranty as a result of Incorrect Chemical Dosing

All Raypak heaters must be installed after the pool/spa system pump and prior to any chemical dosing or chlorination system. Chemical dosing or chlorination systems must be located as far from the heater as possible and a backflow prevention device must be installed between the heater and such systems.

Ideally any chemical dosing system should also be installed below the water connection level of the heater.

Installation above this level may lead to chemical seepage back into the heater even with a backflow prevention device. This will result in damage to the heat exchanger and will **void warranty**.

Caution! *Chemicals that are allowed to enter the heater without having first passed through the pool or spa will damage the heat exchanger of the heater and consequently will **void warranty**.*

***Never** add chemicals to the skimmer box, leaf basket, or near the return line from the pool to the heater.*

Water Connections

Raypak heaters with **Polymer** headers are designed for direct connection to PVC pipe. Use only Class 12 PVC fittings or better.

Raypak Premium heater models 127 and 167 with **Bronze** headers must be connected to PVC pipe. Use only Class 12 PVC fittings or better.

Water Flow

Correct flow rate of water to the heater is critical for correct operation.

Raypak heaters are fitted with an internal by-pass to redirect excessive water flow however should the flow rate exceed that given in the table below; an external PVC type by-pass must be fitted. Setting of the valve must be done at the time of commissioning.

Caution! *Sooting caused by incorrect setting of a by-pass valve or failure to fit a by-pass valve when required will **void warranty**.*

The Raypak heater must be commissioned by the installer prior to normal operation or handover. Installation or connection of the heater to the gas supply by unqualified trades' persons will **void warranty**.

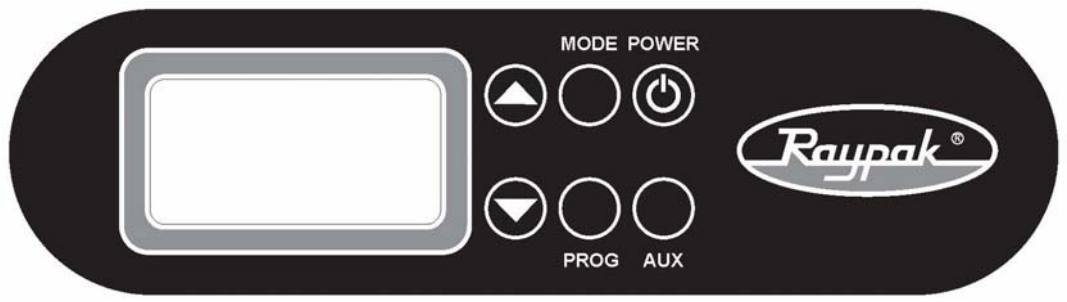
The installer must also supply the owner with a compliance certificate at the completion of commissioning.

Min/Max Flow Rates

Model	Min. l/s	Max. l/s
Spartan	1.3	6.9
127	1.0	3.7
167	1.0	3.9
200	1.3	6.9
280	1.6	6.9
350	2.3	6.6
430	2.5	6.9

OPERATING INSTRUCTIONS

HEATER CONTROLLER LAYOUT



Note: *The **MODE** button switches between **Pool** and **Spa** modes.*

BEFORE OPERATING

1. Ensure that the immediate area around the heater is clear of all combustible materials including chemicals and gases.
2. Familiarise yourself with the hand operated gas isolation valve located outside your heater.
3. Ensure that the heater is free from obvious damage.
4. Ensure that the correct power connections have been made and are able to be isolated.

SERVICE CODES

If the controller detects an error in one of its safety circuits it will display a Service code. The codes are as follows:

1. PO – No mains power to the unit
2. o – Insufficient water pressure
3. F1 – Water temperature exceeds maximum permitted
4. F2 – Main sensor open circuit
5. F3 – Main sensor short circuit
6. F4 – Secondary sensor short circuit

When the mains power supply is interrupted, the unit will revert to a standby mode utilising the back-up battery supply. (This will last for at least two hours providing the unit has had sufficient operating time to charge the capacitor).

The unit will not provide heat whilst there is no mains power. The controller will, however, retain its settings as long as the battery has charge. Upon resumption of mains power, the unit will revert to the state it was in prior to the mains power being interrupted.

Whenever the controller is on and there is insufficient water pressure to activate the pressure switch it will display the letter “o”. There is either insufficient water pressure in the system (e.g. pump is not operating) or the pressure switch requires adjustment.

There is a high limit temperature safety device built into the heat exchanger header. In the event of a system fault resulting in water temperature exceeding the maximum limit of this device, the controller will display F1.

In the event F1 is displayed, the unit must be allowed to cool and the controller **MUST** be switched OFF and then ON again before the unit will resume normal operation. (This is a safety requirement of the Australian Standard).

F2, F3 and F4 are errors relating to the unit’s temperature sensors. The errors arise from problems with the sensors or the sensor connections. In the event one of these errors is displayed you should contact your Rheem Service agent.

SETTING TIME & DAY

Each time that power is reconnected to the heater the internal heater time clock should be set. Each and every time the heater has been isolated at the GPO, e.g. for service, this process must be repeated.

1. Connect the heater to a 240V 10A GPO and turn on.
2. With the controller displaying **OFF**, simultaneously press and hold the ▼ and **PROG** and buttons to access the time set mode.
3. The system time will then flash on the display. To adjust the time of day, press the ▲or ▼buttons until the correct time is reached.
4. Once the time has been set, press and release the **PROG** button to access the day of week mode.
5. The day will flash on the display. To adjust the day, press the ▲or ▼buttons.
6. Press and release the **PROG** button to lock the day setting and return the control to the OFF mode.

OPERATING INSTRUCTIONS

1. Before switching the heater On, ensure all water flow control valves are in their correct position. This can be tested by manually operating the system pump and ensuring that water is flowing through the heater.
2. Ensure that the gas supply is turned on.
3. Press the **POWER** button on the face panel of the heater. The heater will display the current water temperature of the pool.
4. Press the ▲button on the control panel of the heater until the desired temperature set point is reached.
5. The heater will ignite when the set point temperature is above the measured water temperature. If a pump is connected to the heater this will also commence operation.

   Note: *The heater will not ignite if there is no water flow through the heater.*
6. If the heater does not ignite after 90 seconds, turn off the power by pressing the **POWER** button and ***wait 1 minute*** before repeating all steps.
7. If the heater does not light on the second attempt, turn off the heater and isolate the gas supply and contact your installer or Raypak.

TEMPERATURE SELECTION

Caution! *Prolonged exposure to elevated water temperatures can be hazardous.*

Temperature selection is made by selecting either the ▲or ▼arrow buttons located on the face of the heater controller. After depressing either of these buttons the current desired temperature set point will be displayed. Continuing to press either button will alter the heater set point. Once the desired set point temperature is selected the display will return to show the current water temperature, after a short delay.

For continued manual operation of the heater in this manner ensure that the display is not showing AUTO. If AUTO is displayed pressing the **PROG** button will return the heater to manual operation.

MODE SELECTION (POOL/SPA)

The **MODE** button on the control panel enables both the pool and spa temperatures to be set independently. The two set point temperatures are stored by the heater controller and are used when the desired mode is selected.

To select the desired mode press the **MODE** button. The selected mode is shown on the heater display. The heater will then operate according to the mode selected.

If the Pool mode is selected, the heater will heat the water until the pool set point temperature is reached. If Spa mode is selected the heater will heat the water until the spa set point temperature is reached.

Motorised Valves (if installed)

Models: 200, 280, 350, 430 Only

The pool heater controller included in the above models is fitted standard with a 24VAC output for operation of motorised diverter valves (if fitted by your pool system installer). Where motorised diverter valves are installed they may be connected to the heater by the installer so that when the **MODE** button is pressed, the diverter valves direct flow to and from the desired destination, i.e. Pool or Spa after a delay of approximately 5 seconds.

Caution! *Motorised valves must never be installed so that they can move through a closed inlet position while the pump is operating and allow the system to pressurise. This situation will* ***void warranty*** *and may significantly damage the pool heater and other system equipment and possibly lead to personal injury.*

Note: *Control of motorised diverter valves requires connection of the valve actuators to the 24VAC terminal strip included in the pool heater. This terminal strip is built as standard on pool heater models 200 to 430 but is not included on any other model. A relay may be added by a licensed electrician in accordance with the wiring diagram included in this booklet to provide this function.*

Note*: Wired connection of actuators must be completed by a licensed electrician.*

PUMP CONNECTION TO HEATER

Models: 200, 280, 350, 430 Only

The above model pool heaters are fitted standard with a 240V AC power socket to enable connection of a pool/spa circulation pump. In most circumstances this pump will be the system pump, required also for filtration and would normally be connected to a filtration system time clock.

To enable operation of the pump via the heater controller the pump must be connected to the heater power socket located inside the heater cabinet on the underside of the controller housing. This is accessed by removing the front door of the heater.

If the pump is required to operate with the filtration system (as is normally the case), the additional lead included with the heater (coiled inside heater cabinet) must be connected to the pump power outlet located on the filtration system time clock controller. If this connection is not made the pump **will fail** to operate the filtration system correctly. If the pump is not required to operate in conjunction with the filtration system it is possible to connect the additional 3-pin lead and plug included with the heater to a suitable GPO. This GPO should normally be left in the “off “position. Switching the GPO “on” will override and heater control of the pump and power the pump directly from the GPO.

Once the correct pump power connection is made, the pump will operate as per the approximate time periods of the following table.

Condition	Period
At start up	3 mins
At shut down (when heating)	5 mins
Each 30 min’s from switching on.	3 mins
In spa mode	Continuous
In pool mode and below temp.	Continuous
Filtration operating	Continuous
Filtration in manual operation	Continuous
In Auto mode	Program

SERVICE

Caution! *Always isolate all connections to the heater, including any pump connections, before commencing any service work.*

Only a properly trained service technician should carry out work on your pool or spa heater. Regular service (at least annually) should be carried out to ensure that the gas valves and burner are clean and free from damage and that the heat exchanger is unobstructed and free from sooting.

It is recommended that prior to commencing operation of your pool heater each year a service inspection be undertaken.

PROGRAMMING OF HEATER CONTROLLER

The controller located on the front of your Raypak heater is capable of both manual and programmable operation. The following instructions describe how the controller may be programmed for timer operation.

Before the controller can be programmed the time of day clock and day of week must be set.

SETTING TIME & DAY

Before the heater is operated the internal heater time clock should be set. Each and every time the heater has been isolated at the GPO, e.g. for service, this process must be repeated.

1. Connect the heater to a 240V 10A GPO and turn on.
2. With the controller displaying **OFF**, simultaneously press and hold the ▼ and **PROG** and buttons to access the time set mode.
3. The system time will then flash on the display. To adjust the time of day, press the ▲or ▼buttons until the correct time is reached.
4. Once the time has been set, press and release the **PROG** button to access the day of week mode.
5. The day will flash on the display. To adjust the day, press the ▲or ▼buttons.
6. Press and release the **PROG** button to lock the day setting and return the control to the OFF mode.

AUTO MODE

Auto mode allows the controller to:

1. Turn the pool heater on or off over 4 separate time periods each day.
2. Control water temperature.
3. Control mode settings (Pool or Spa)
4. Control and auxiliary equipment that may be connected via the Raypak Equipment Interface Box (if installed).

Auto mode can be selected by pressing the **PROG** button and releasing. AUTO should now be displayed. The heater has been factory set with four default time periods. These will be used if no other program is set and AUTO is selected on the controller. The following table shows the factory set AUTO mode program settings. The controller will retain all program settings even with the removal of the power supply.

Timer Period	Start Time	Temp ° C	Mode	Auxiliary Outputs
1	6:00am	24	Pool	All Off
2	10:00am	OFF	Pool	All Off
3	2:00pm	24	Pool	All Off
4	6:30pm	OFF	Pool	All Off

PROGRAMMING MODE

IMPORTANT!

Heater must be in AUTO mode before timer periods can be set. AUTO mode is selected by pressing the PROG button.

All time periods must be programmed, even if not required and must be set in the correct time sequence for the controller to operate correctly in AUTO mode. **Note:** *The programming operation can be exited at anytime by selecting the* **POWER** *button.*

Example:

TIMER PERIOD	START TIME	If these time periods are set the operation sequence will be as follows:
1	7:00am	Period1>Period2> Period4 Period 3 will be ignored
2	9:00am	
3	8:30pm	
4	9:00pm	

With the controller in the AUTO mode, switched “On” and displaying the current water temperature, press the **PROG** button for at least 5 seconds to access the programming mode. The time of day will be displayed briefly prior to accessing programming mode.

1. Once the programming mode has been accessed SET and day of week selection will flash.
2. The first item to be programmed is the day of the week. Use the ▲or ▼buttons to scroll through the days of the week. Press **PROG** to lock in the day selection/s.
3. The start time of period 1 will then flash. Press the ▲or ▼buttons to adjust the start time. Press the **PROG** button to lock in the start time.
4. Either POOL or SPA will now flash in the display indicating the mode selected. Use the **MODE** button to toggle between Pool and Spa modes. Press the **PROG** button to lock in the selected mode.
5. The desired temperature for the selected mode must now be set for period 1. On first use the temperature will flash OFF. This setting is used when the heater is not required to heat the water but the time setting is to be used for operating auxiliary equipment. Use the ▲or ▼buttons to scroll through the temperature settings. The minimum set temperature is 18°C. Pressing the ▼button when the temperature is at 18°C will select the OFF mode for period 1. Press **PROG** to lock in the temperature selection.
6. The Auxiliary Output selection/s will now flash. Use the ▲or ▼buttons to scroll through the six (6) auxiliary selections.

Note: *Programming auxiliary equipment operation is only necessary if the Raypak Equipment Interface Box (EIB) is installed and auxiliary equipment has been connected.*

7. To turn an auxiliary output “On” press the **AUX** button when the desired AUX item (1 to 6) is flashing. The word On is then displayed above the auxiliary selection. Press the ▲button to move to the next available auxiliary output.
8. Once the desired selection/s have been made, press **PROG** to lock in the auxiliary output/s.
9. The display will now move to timer period 2 which may be programmed in the same manner.

Note: *All four timer periods must be programmed even if all temperature selections and auxiliary outputs are set to off or not required. The program function will operate each timer period in the sequence 1 to 4.*

10. The display will now return to its normal position.

CHILD LOCK FUNCTION

The child lock function will render all 6 controller switches inactive.

1. To activate the child lock function press and hold both the ▲and ▼buttons for 10 seconds. The lock symbol will be displayed.
2. To cancel the child lock function press and hold the ▲and ▼buttons for 10 seconds.

ELECTRICAL CONNECTIONS OF POOL/SPA MOTORISED VALVES

(Models, 200, 280, 350,430 Only)

WARNING! – ALL ELECTRICAL WORKS MUST BE COMPLETED BY A LICENSED ELECTRICIAN

DANGER! This heater may be coupled to two sources of 240V AC power. Isolate all power sources prior to commencing any installation, service, or other work. See also warnings included on the heater.

POWER CONNECTION(S)

The heater includes a loosely coiled 3-pin 240VAC power lead for connection to a mains power 10A GPO. This connection is required for operation of the heater.

The heater should be properly connected to a GPO that is suitable for either indoor or outdoor use. Prior to connection inspect the supplied power connection lead for any damage.

DO NOT connect the heater to any power source if there is any sign of damage.

For models 200, 280, 350, and 430 a second 3-pin 240VAC power lead is connected to the underside of your heaters control panel, inside the door.

This power lead is included for use when a filtration system pump is to be connected to the heater for control by both the heater and the filtration system.

Where two 240VAC connections are to be made it must be ensured that both operate of the same supply phase.

PUMP CONNECTION

MODELS 200, 280, 340, 430 Only

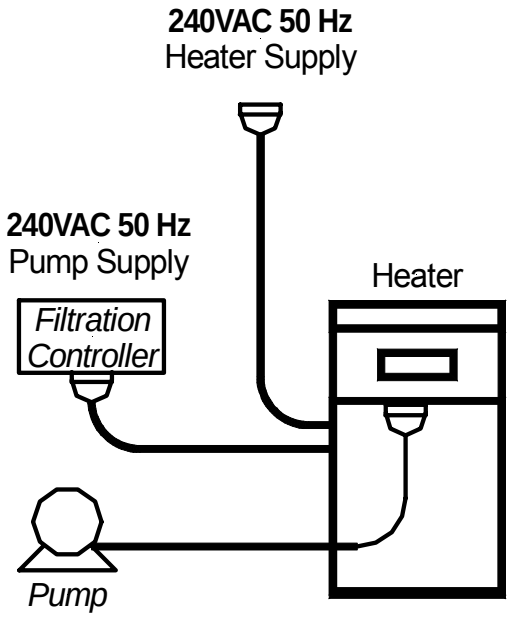
A 240VAC system pump can be connected to both the heater and the filtration system to enable heater control or programmed operation via the heater controller or a RAYPAK remote. Electrical connection should be made as shown.

In the connection diagram shown, power supply to the pump will be provided under normal conditions by the Filtration Controller.

Failure to connect the pump via the Filtration Controller will in most cases cause the filtration system to operate incorrectly.

It is also possible to connect a non filtration system pump to the heater. This is done by leaving the labelled power lead inside the heater coiled and unused. This will enable manual operation of the pump if it is required.

Note: *For models, Spartan 131, 127 and 167 (spa heaters) a 240VAC relay can be added to enable operation of the pump as previously described. This component must be installed and connected by a licensed electrician.*



MOTORISED VALVE ACTUATORS

Models 200, 280, 350, 430 Only

Up to two 24V AC motorised diverter valves may be wired to the terminal strip included with the above heater models. This must be completed by a licensed electrician. A relay switches supply between the Red and White wires connected to the terminal strip when the **MODE** button is pressed. In Pool mode the Red wire terminals will be provided with 24V and the White wire terminals 0V.

Following connection of the valves to the terminal strip, the valves will be activated each time the **MODE** button is selected (See **Motorised Valves**).

Motorised Valve Connection Details

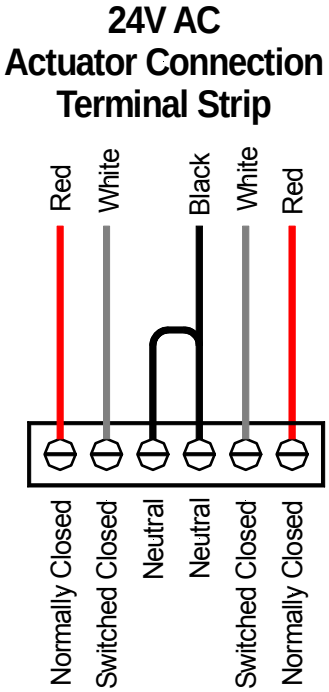
1. Isolate the heater from **all** power sources.

Caution: *Two 240V power connections may be present. Ensure both are disconnected before continuing*.

2. Remove the heater front door.
3. Thread the 24VAC motorised valve actuator wires through the side of the heater via opening provided.
4. Connect the wires into the terminal strip as required (See diagram).

Note: *With "Jandy" valves and most other brands a Red, White and Black wire will be present. In most cases colours should be matched with the factory terminal connections. Any pin type connector at the actuator wire end will need to be removed to enable direct connection to the terminal strip.*

5. Once all connections are made and the door has been replaced, the heater should be reconnected to the electrical supply and the motorised actuators checked for correct positioning when the **MODE** button is selected. If necessary direction of valve actuation may be varied by swapping Red and White wires at the terminal strip.

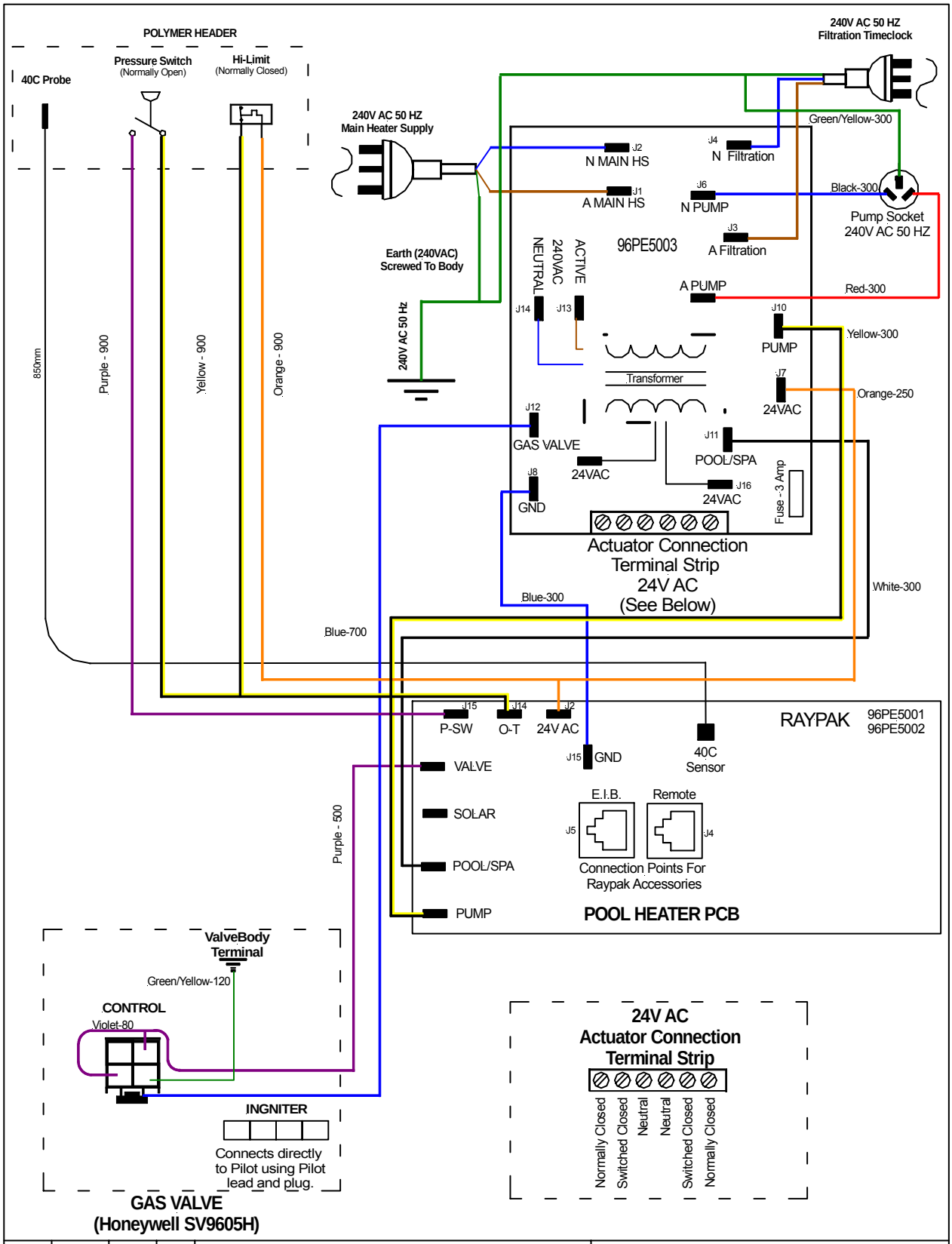


WARNING! *Ensure that each valve operated by the actuator is not able to pass through a position that will close supply from the pump and result in pressurisation of the pool system. Failure to observe this may result in severe damage to the pool system piping, equipment and or cause personal injury and property damage. Correct installation is the responsibility of the system installer.*

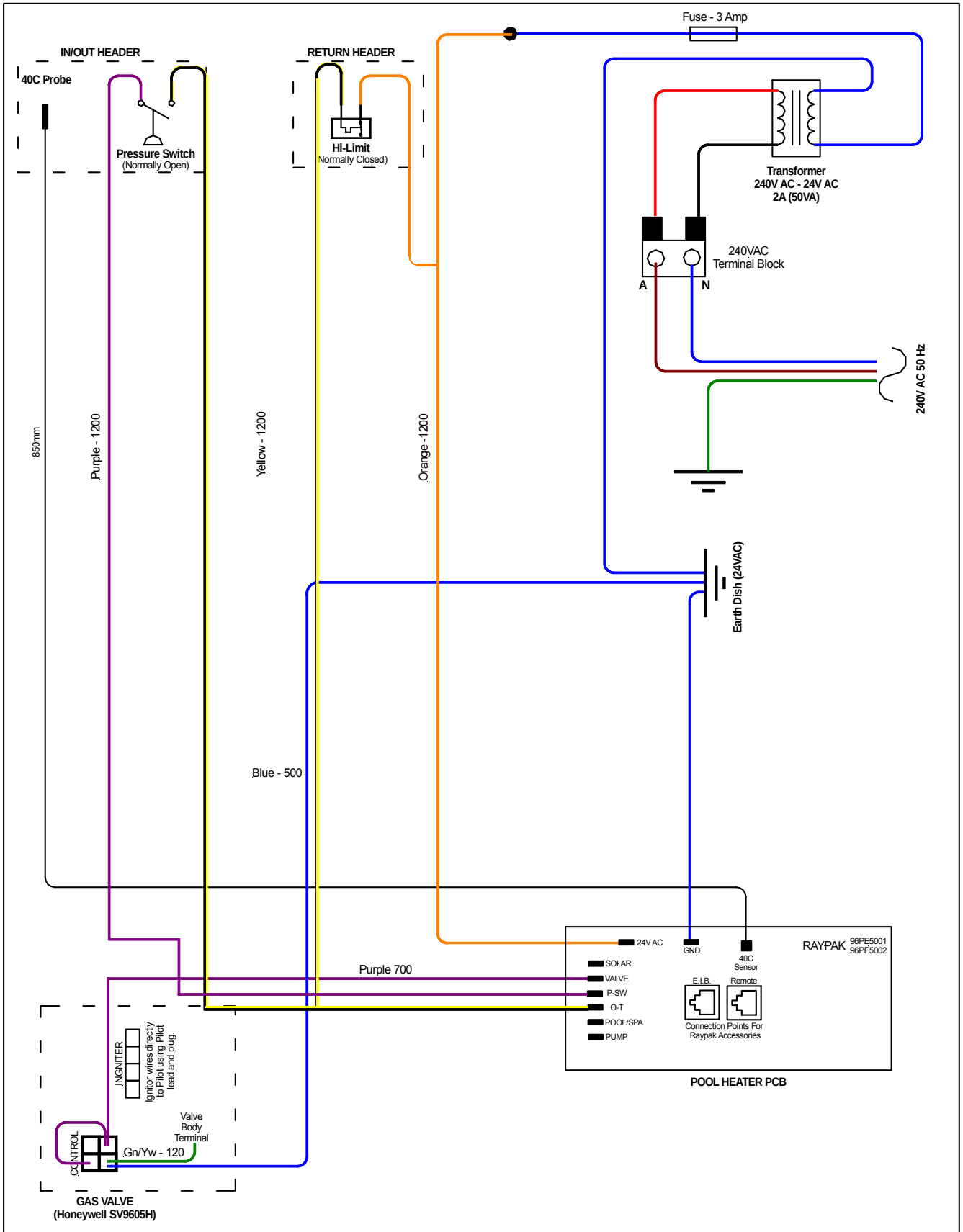
WARNING! *Do not attempt to connect 240V equipment to the 24VAC relay.*

Note: *For models, Spartan 131, 127 and 167 a 24VAC relay can be added to enable operation of actuators as previously described. This component must be installed and connected by a licensed electrician.*

WIRING DIAGRAMS



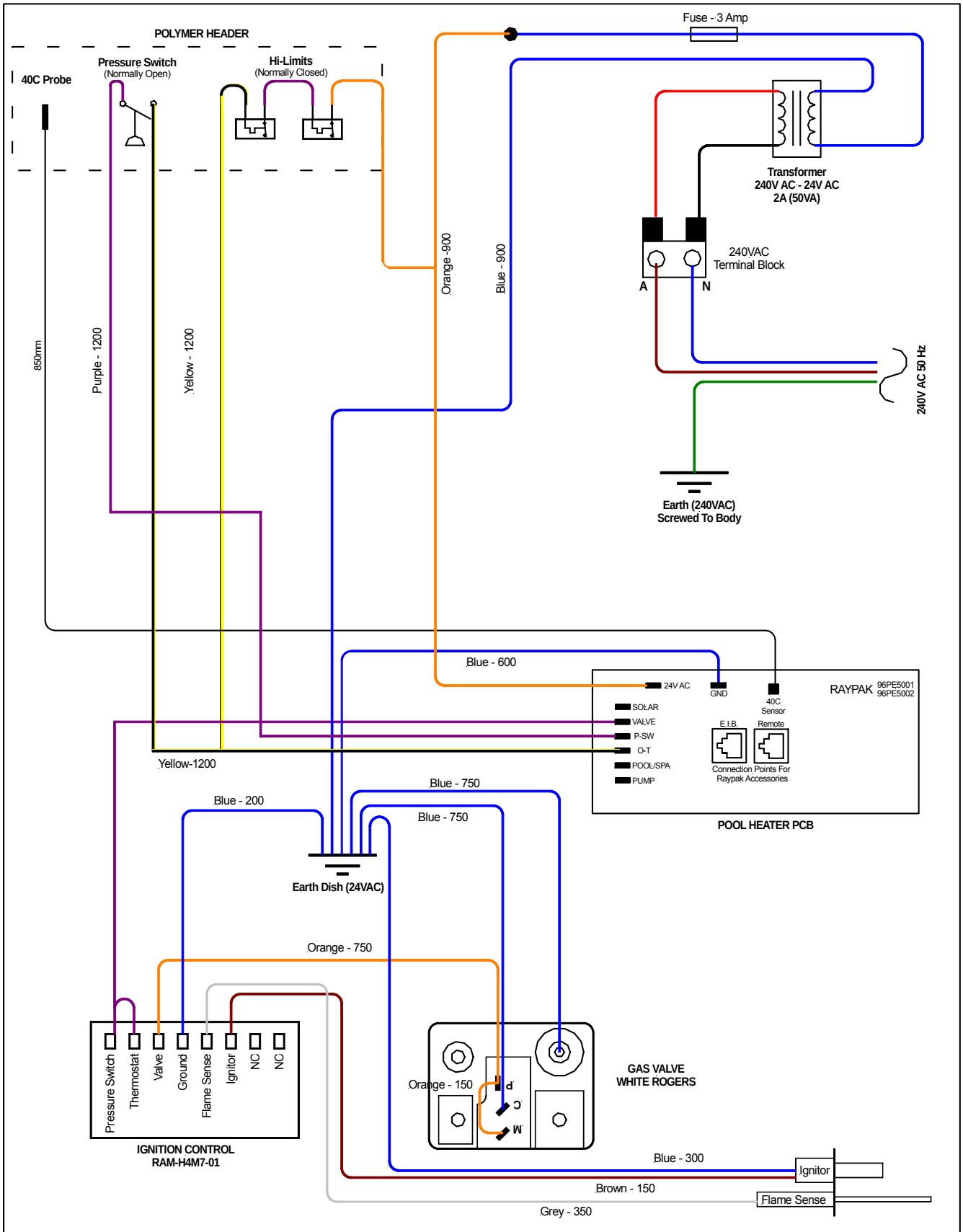
					Pool Heater 2006/07 200 to 430
1	31/10/06	SER		NEW RELEASE	DRG No: 159423
ISSUE	**DATE**	**APPR**	**E.O.**	**DESCRIPTION**	RAYPAK AUSTRALIA Pty.Ltd



ISSUE	DATE	APPR	E.O.	DESCRIPTION
3	9/11/06	S.R.		Introduction of new PCB
2	10/10/05	A.R.		Amended Hi-Limit Position to after PCB
1	20/06/05	A.R.		New Release

POOL HEATER PCB WIRING DIAGRAM
MODEL: 167

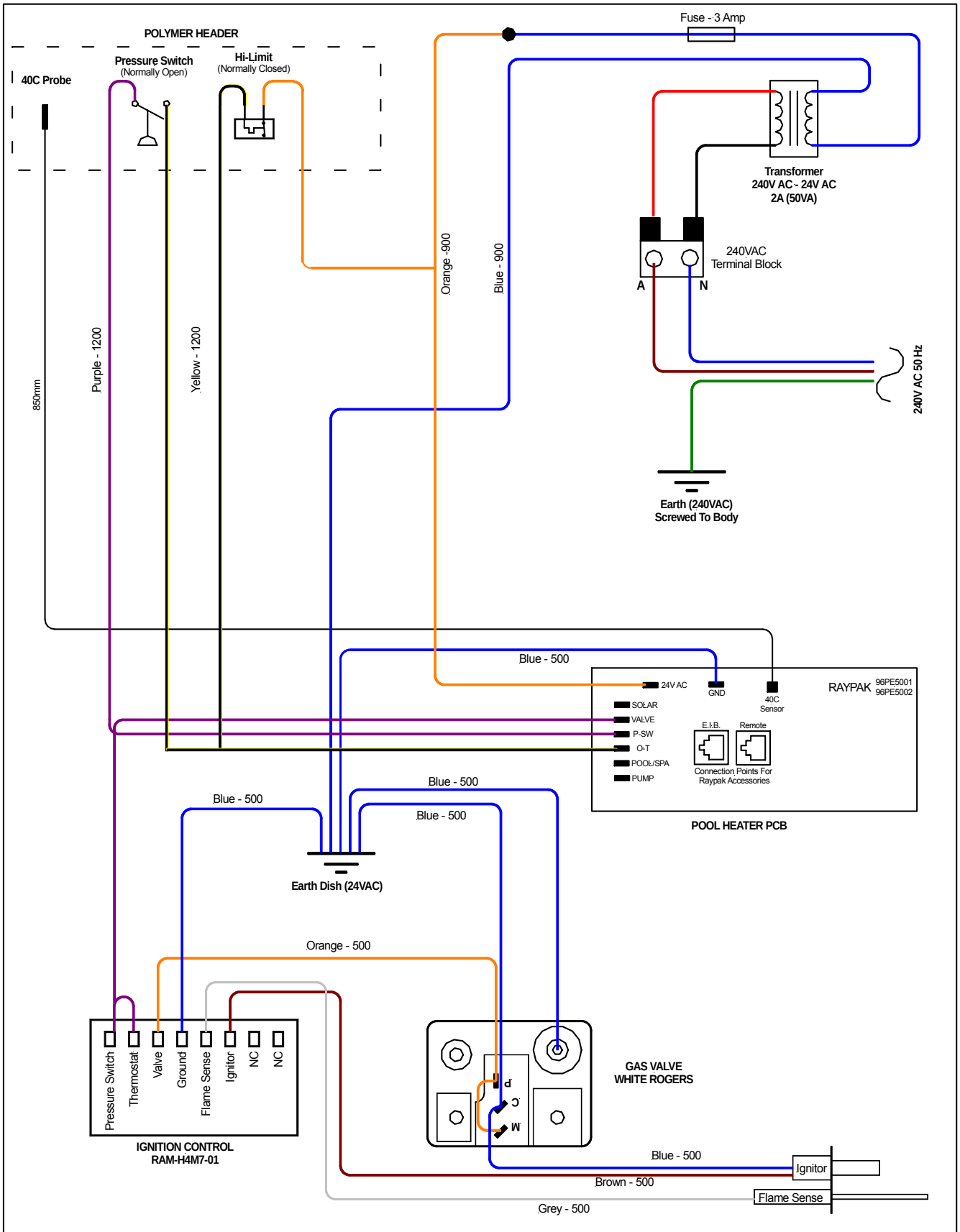
DRG No: 159299



ISSUE	DATE	APPR	E.O.	DESCRIPTION
4	9/11/06	S.R.		Introduction of new PCB
3	10/10/05	A.R.		Amendment of Hi-Limit to after PCB
2	08/08/05	A.R.		Title Change. Addition of extra High Limit
1	20/06/05	A.R.		NEW RELEASE

POOL HEATER PCB WIRING DIAGRAM
MODELS: Spartan 131

DRG No: 159426



ISSUE	DATE	APPR	E.O.	DESCRIPTION
4	9/11/06	S.R.		Introduction of New PCB
3	10/10/05	A.R.		Amendment of Hi-Limit to after PCB
2	8/8/05	A.R.		Modification to Title
1	20/06/05	A.R.		NEW RELEASE

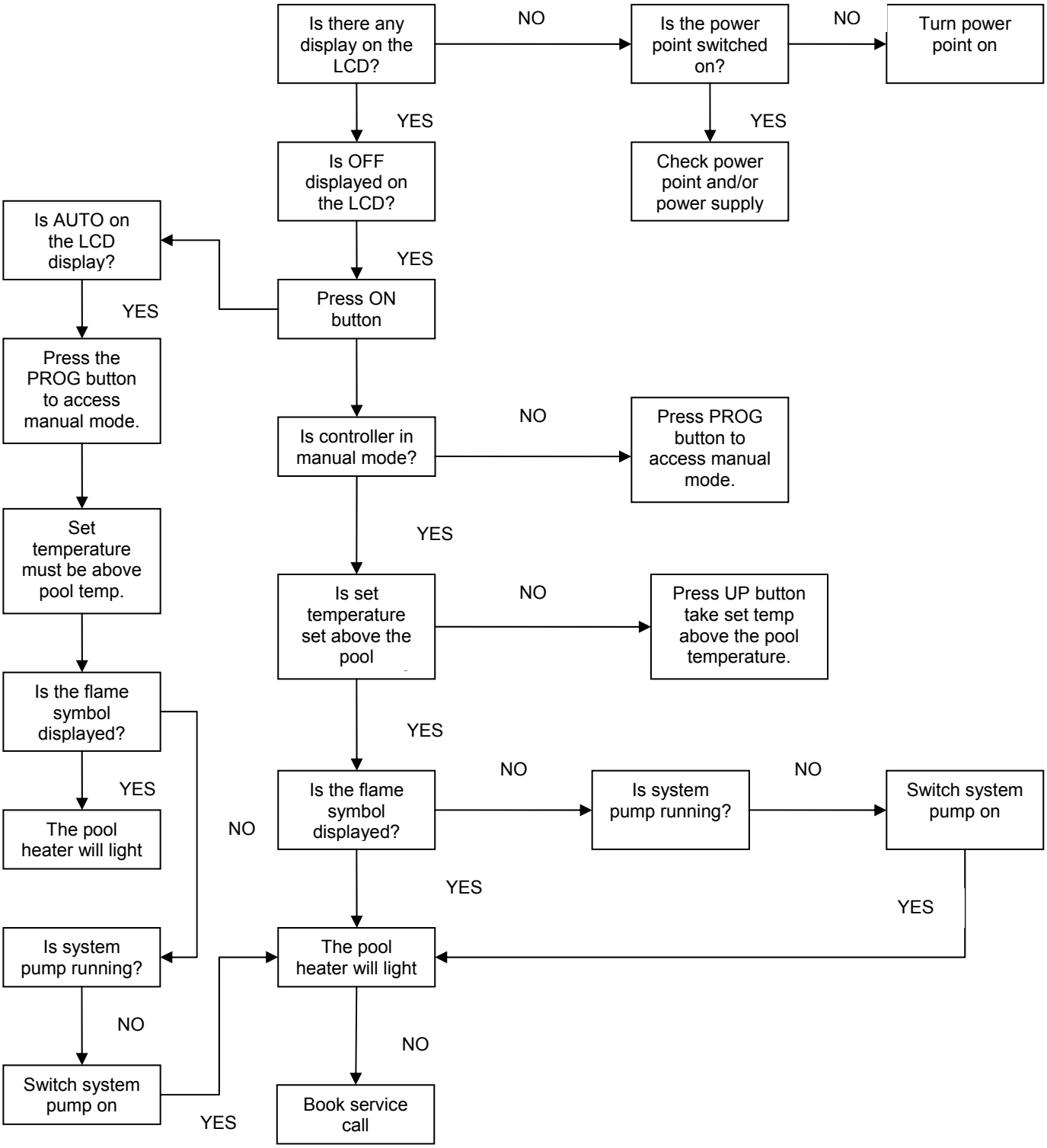
POOL HEATER PCB WIRING DIAGRAM
MODELS: 127

DRG No: 159348

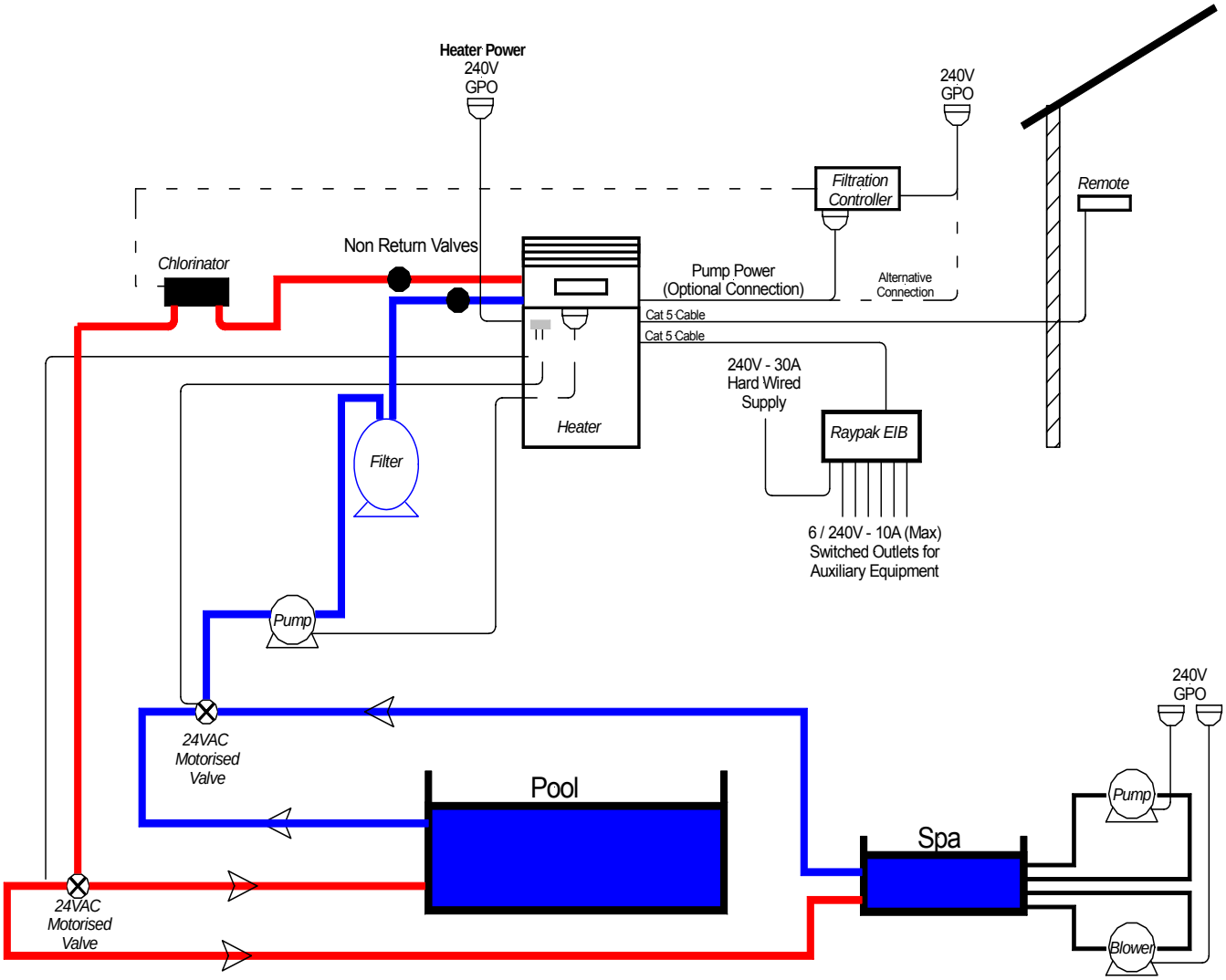
PRODUCT SPECIFICATIONS

MODEL	GAS	INPUT	OUTPUT	BURNER PRESSSURE	INJECTOR DIA.	HEIGHT OUTDOOR	WIDTH	DEPTH	WEIGHT
Spartan 131	Natural	120 MJ/hr	24 kW	0.85 kPa	1.36 mm	860 mm	440 mm	650 mm	35 kg
	Propane	120 MJ/hr	24 kW	2.64 kPa	0.77 mm				
127	Natural	110 MJ/hr	24 kW	0.77 kPa	1.90 mm	895 mm	505 mm	280 mm	42 kg
	Propane	103 MJ/hr	23 kW	2.75 kPa	1.10 mm				
167	Natural	164 MJ/hr	36 kW	0.77 kPa	1.95 mm	905 mm	365 mm	610 mm	67 kg
	Propane	154 MJ/hr	34 kW	2.75 kPa	1.10 mm				
200	Natural	196 MJ/hr	44 kW	0.77 kPa	1.90 mm	1,085 mm	460 mm	650 mm	70 kg
	Propane	185 MJ/hr	41 kW	2.75 kPa	1.10 mm				
280	Natural	278 MJ/hr	62 kW	0.77 kPa	1.90 mm	1,085 mm	565 mm	650 mm	75 kg
	Propane	261 MJ/hr	58 kW	2.75 kPa	1.10 mm				
350	Natural	343 MJ/hr	76 kW	0.77 kPa	1.90 mm	1,085 mm	655 mm	650 mm	85 kg
	Propane	323 MJ/hr	72 kW	2.75 kPa	1.10 mm				
430	Natural	420 MJ/hr	94 kW	0.77 kPa	1.90 mm	1,085 mm	740 mm	650 mm	90 kg
	Propane	396 MJ/hr	88 kW	2.75 kPa	1.10 mm				

POOL HEATER OPERATION FLOW CHART



TYPICAL POOL/SPA SYSTEM DIAGRAM



- **Free chlorine must not exceed 4ppm!**

IMPORTANT!

The most frequent cause of damage to a Raypak pool heater is incorrect water balance resulting from overdosing of chemicals. All chlorinators must feed downstream of the heaters and have an anti-siphoning device to prevent chemical back up into the heater when the pump is shut off.

WARRANTY (AUSTRALIA ONLY)

Rheem Australia will repair or if necessary replace any Raypak pool or spa heater; or any component of the pool or spa heater which fails within the Warranty Periods specified hereafter, in accordance with and subject to the conditions and exclusions mentioned herein.

WARRANTY PERIODS

Residential Model Heaters:

P0131, P0200, P0280, P0350, P0430

When installed at a Single Family Dwelling for the purpose of heating a pool or spa:
- Parts 3 years
- Labour 1 year

When installed at other than a Single Family Dwelling for the purpose of heating a pool or spa:
- Parts 6 months
- Labour 6 months

Premium (Commercial) Model Heaters:

P0127, P0167, PC0280, PC0430

When installed for the purpose of heating any pool or spa:
- Parts 3 years
- Labour 1 year

Notes:

1. Rheem Australia is responsible for all service activities relating to Raypak Australia product.
2. Rheem Australia reserves the right to transfer fully functional components from a defective heater to a replacement heater if required.
3. In addition to this warranty, the Trade Practices Act 1974 and similar laws in each State and Territory, provide the owner with certain minimum statutory rights in relation to your heater. This warranty must be read subject to all relevant legislation and nothing in this warranty has the effect of excluding, restricting or modifying those rights.

WARRANTY CONDITIONS

1. This warranty is applicable only to pool and spa heaters manufactured from August 1st, 2005.
2. The pool or spa heater must be installed in accordance with the Raypak installation instructions included with the heater and in accordance with all statutory, local and State requirements.
3. Where a failed component or heater is replaced under warranty the balance of the original warranty period only will remain effective. The replaced part or heater does not carry a new warranty.
4. Where the heater is installed outside the boundaries of a metropolitan area as defined by Rheem, or further than 25km from a regional Rheem branch office or an accredited Rheem service Agent, the cost of transport, insurance and travelling costs between the nearest Rheem branch or Rheem Agents premises and the installed site shall be the owner's responsibility.
5. The warranty only applies to the Raypak supplied heater and genuine (Rheem or Raypak sourced) component replacement parts and therefore does not cover any plumbing or electrical parts supplied by the installer and not an integral part of the Raypak supplied heater, e.g. pressure limiting valves, isolation valves, non-return valves, electrical switches, pumps, fuses, etc.
6. The heater must have been correctly sized for the pool/spa hot water demand in accordance with Raypak pool and spa heater literature available from Raypak on request.

WARRANTY EXCLUSIONS

Repair and replacement work will be carried out as described in the Warranty Period, however the following exclusions may cause the warranty to become void and may incur a service charge and/or the cost of any parts used.

1. Accidental damage to the heater or any component, including:
   a. Acts of God;
   b. Failure due to misuse;
   c. Incorrect installation;
   d. Attempts to repair carried out by other than Rheem or an accredited Agent;
2. Where it is found that there is nothing wrong with the heater.
3. Where the complaint is related to excessive discharge from the pressure relief valve (if fitted) due to excessive water pressure.
4. Where there is no flow of water due to faulty plumbing;
5. Where water leaks are related to plumbing including connections to the heater.
6. Where there is a failure of gas or electricity supply or they do not comply with relevant codes or acts.
7. Where the heater or its components have failed directly or indirectly as a result of:
   a. Excessive water pressure;
   b. Excessive temperature and/or thermal input;
   c. Corrosive atmosphere;
   d. Incorrect flow rate through the heat exchanger.
8. Where the heater is located in a position that does not comply with the Raypak installation instructions or relevant statutory requirements causing the need for major dismantling or removal of any structure, or the requirement of special equipment to bring the heater to a serviceable position.
9. Repairs of any nature due to corrosion or scale formation of any of the heater components in contact with the pool or spa water.

Subject to any Statutory provisions to the contrary, this warranty excludes all claims for damage to furniture, carpets, walls, foundations or any other consequential loss either directly or indirectly due to leakage from the pool heater or its fittings caused by any mode of failure.

SERVICE

SERVICE ASSISTANCE

Service must only be undertaken by properly authorised personnel

It is a requirement of all Raypak and all gas authorities that the heater be serviced at least once per year, where it is used in a specific application, e.g. pool heating, it would be practical to perform the service at the commencement of the heating season, or at any time there may be an indication of a problem.

This service should include the cleaning of the gas burners, inspection of waterways, and checking of all controls for correct operation.

It is important and very often will save time if you state the model number, serial number and type of gas used. This information will be found on the heater data plate.

Your local Raypak distributor will arrange for your service or recommend a qualified service organisation.

Australia
Rheem service
13 10 31
www.rheem.com.au

NEW ZEALAND
0800 657 335

NATIONAL		QLD	SYD/CANB	NEWCASTLE	VIC	SA	WA
Service:	Phone:	07 3213 0100	029684 9280	02 4961 3515	03 9212 8900	08 8343 0000	08 9351 4238
	Fax:	07 3213 0154	02 9684 9188	02 4961 3117	03 9212 8955	08 8359 6002	08 9353 4101
Spares:	Phone:	07 3213 0102	02 9684 9282	02 4961 3515	03 9212 8911	08 8359 0044	08 9351 4290
	Fax:	07 3213 0154	02 9684 9188	02 4961 3117	03 9212 8984	08 8359 6003	08 9356 9914

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